Evaluation of Sleep Apnea and Chronic Pain Management

Lauren E. Williams RN, BSN
FNP-DNP Student
East Carolina University

2017 NPSS
Asheville, NC
Background in Nursing & Pain Management

- Graduated with BSN May 2011
- Inpatient Pain Management Resource Nurse
- Outpatient Pain Management Since December 2012
- Started DNP Program 2014
- Graduation May 2017 with FNP-DNP
- FNP Plans: Outpatient Pain Management
Project Committee

• Chair:
  – Dr. Ann Schreier

• Committee Member:
  – Dr. Dianne Marshburn
Background of Problem

• Chronic Pain
  – 100 Million Adults in America
  – More Than Total Combination of Those Affected with Heart Disease, Cancer and Diabetes
  – $635 Billion a Year in Treatment and Loss of Productivity
    (IOM, 2011)

• Obstructive Sleep Apnea (OSA)
  – Affects up to 5% of General Population
  – Often Undiagnosed
    (Ward, 2015)
Project Setting

• Outpatient Pain Management Center
  – Department of Local Hospital
  – 7 Providers Rotate Clinic Sites
  – Approximately 50-80 Patients Daily
• Identification of Practice-based Issue
  – No OSA Screening
  – Opportunity for Quality Improvement Initiative
Project Objective

• Determine if using a tool to evaluate the risk of obstructive sleep apnea in patients receiving chronic opioid medication therapy would be effective in identifying a need for change in provider practice in an outpatient pain management setting.
Literature Review

- PubMed Database
  - Terms: Sleep Apnea, Chronic Pain and Chronic Opioids
    - Narrowed for Relevance
  - Separate Literature Review Specific to STOPBang Questionnaire
    - Primary Care Use
  - Strengths/Weaknesses/Gaps
Identified 250 potentially relevant titles through search

- Exclusions were made based on duplicates, acute pain/inpatient studies, opioid induced sleep apnea topics or central sleep apnea topics

Reviewed 75 abstracts in detail

- Exclusions were made to specifically include chronic opioid use, obstructive sleep apnea and chronic pain. STOPBang tool articles excluded all inpatient/perioperative use of tool

Reviewed 30 articles in full

- Exclusions for relevance to chronic opioid use as it relates to obstructive sleep apnea

Identified/ Included 10 literary sources in synthesis of evidence
Opioid Prescribing

- Opioid Medications in the U.S.
  - 149% Increase 1997-2007
    (Mador and Henderson, 2014)
  - 7.3% Increase 2007-2012
  - 20% of Patients with Non-Cancer Related Pain Received Opioid Rx
  - 259 Million Opioid Pain Medications Prescribed in 2012
  - Family Practice, General Practice and Internal Medicine
    (CDC, 2016)
Opioid Prescribing

• Treatment of Chronic Pain
  – Often Unrecognized
    • Minority Groups
    • Women
    • Elderly
    • Cognitive Impairment
    • Cancer Related Pain Near End of Life
  – Uncontrolled Pain
    • Clinical, Psychological & Social Consequences
    • Decreased Work Productivity
    • Reduced Quality of Life

(CDC, 2016)
Opioid Prescribing

- The American Academy of Pain Medicine Board
  - Eight Principles for Safer Opioid Prescribing
    - Risk for Misuse/Abuse
    - Comorbid Mental Illness
    - Slowed Titration
    - Avoid Benzodiazepines
    - Methadone Second-Third Line
    - OSA
    - Long Acting Opioid
    - Reduced Dose During Acute Respiratory Illness

(Webster, 2013)
Opioid Prescribing

- CDC Guideline for Prescribing Opioids for Chronic Pain
  - Twelve Recommendations
    - Initiation & Continuation
    - Treatment Goals
    - Risk & Benefits
    - Opioid Selection, Dosage & Duration
    - Avoid Benzodiazepines
    - Need for follow up

(CDC, 2016)
Obstructive Sleep Apnea & Opioids

• Opioid Effects on Respiration
  – Dampen Chemoreceptive Response
  – Lengthen Exhalation
  – Increase Upper Airway Resistance
  – Negative Effects Potentiated During Sleep
    (Jungquist et al., 2012)
  – Worsen Central Sleep Apnea
    (CDC, 2016)
  – Opioid Dosage, Route & Duration of Therapy
    (Jarzyna et al., 2011)
Current Recommendations

- OSA & Opioids
  - Minimize Opioid Use
  - Consider Alternative Therapies
  - Careful Monitoring & Dose Titration
  - Avoid in Patients with Moderate to Severe OSA
  - Prescription Opioid Antagonist
    (CDC, 2016)
  - Consider Sleep Study Evaluation Referral
    (Epstein et al., 2009)
  - General OSA Recommendations
    (Goldberg, 2009)
The STOPBang Questionnaire

• Sensitivity in Sleep Clinic Population:
  – 90% Detection Any OSA
  – 94% Detection Moderate to Severe OSA
  – 96% Detection Severe OSA
    (Nagappa et al., 2015)

• Primary Care Use:
  – Rule Out OSA Score Less Than Two
  – Diagnose OSA Score Six or Higher
    (Fenton et al., 2015)

• More Sensitive in Identifying Moderate to Severe OSA
  (Ward, 2015)
Limitations

• Literature Review:
  – Strengths
  – Weaknesses
  – Gaps
Conceptual Framework

• Theoretical Basis:
  – Nursing Theorist: Faye G. Abdellah
    • Patient Centered
    • Restorative & Preventative
    • Sub-Concepts
      – Promoting Nutrition, Sleep, Oxygenation and Problem Solving
        (Gonzalo, 2011)
Methodology

• Needs Assessment:
  – Current Provider Practice
    • No Standard Screening for OSA
  – CDC (2016) Guidelines for Prescribing Opioids for Chronic Pain
Methodology

• Organizational Support:
  – Provider and Organizational Support
  – Preliminary Institutional Review Board (IRB) Review
    • Quality Improvement Initiative
Methodology

• Sample:
  – Adult Chronic Pain Patients Receiving Opioid Medications
  – Twenty-Five Different Patients Weekly Over Eight-Weeks
  – End Sample Size Goal of 200
  – Each Provider’s Patients Screened

• Protection of Human Subjects:
  – No Patient Identifiers
  – Prewritten Letter to Obtain Verbal Consent
Methodology

• Instrument:
  – The STOPBang Questionnaire
    • Permission from The University of Toronto
    • Questionnaire Consists of Eight Simple Questions
      – Snoring, Tiredness, Observation, Hypertension, BMI, Age, Neck Size and Gender
    • Answers Summed
      – Score 0-8 Correlates Associated Level of Risk
        (University of Toronto, 2012)
Snoring?
Do you **Snore Loudly** (loud enough to be heard through closed doors or your bed-partner elbows you for snoring at night)?

Tired?
Do you often feel **Tired, Fatigued, or Sleepy** during the daytime (such as falling asleep during driving or talking to someone)?

Observed?
Has anyone **Observed** you **Stop Breathing** or **Choking/Gasping** during your sleep?

Pressure?
Do you have or are being treated for **High Blood Pressure**?

Body Mass Index more than 35 kg/m\(^2\)?

Age older than 50?

Neck size large? (Measured around Adams apple)
For male, is your shirt collar 17 inches/43 cm or larger?
For Female, is your shirt collar 16 inches/41 cm or larger?

Gender = Male?

Scoring Criteria:
For general population
OSA-Low risk: Yes to 0-2 questions
OSA-Intermediate risk: Yes to 3-4 questions
OSA-High risk: Yes to 5-8 questions
or Yes to 2 or more of 4 STOP questions + male gender
or Yes to 2 or more of 4 STOP questions + BMI > 35 kg/m\(^2\)
or Yes to 2 or more of 4 STOP questions + neck circumference (17”/43cm in male, 16”/41cm in female gender)
Methodology

• Method of Data Collection and Analysis:
  – Staff Education
  – Sample Population
  – Screening with STOPBang Questionnaire
  – Evidence Based Provider Recommendations
  – Documentation of Results
Guidelines for Opioid Prescribing Based on STOPBang Screening Results:

These guidelines may serve as considerations for practice when prescribing opioid medications. Some recommendations reflect general principals of opioid prescribing, as well as alternative treatment options and behavioral modifications.

General Recommendations
- Non-opioid medications to treat pain and alternative therapies (Physical Therapy, interventional pain procedures, acupuncture, massage therapy, yoga/meditation, lifestyle modification) (CDC, 2016)
- No concurrent benzodiazepine use (Webster, 2013)
- Recommend behavioral modifications such as: sleep positioning on side or stomach instead of back, use of pillows to elevate body above waist, weight loss, avoidance of alcohol/sedatives and avoidance of large meals before bed (Goldberg, 2009)

Low OSA Risk (STOPBang score of 0-2)
- Can rule out OSA (Fenton et al., 2015)

Intermediate OSA Risk (STOPBang Score of 3-4)
- Sleep Evaluation Referral based on individual symptoms/screening results and comorbidities, possible sleep study and use of CPAP (Epstein et al., 2009)
- Slowed titration and dose reduction in patients on moderate to high doses of opioids (Webster, 2013)
- Naloxone Prescription (CDC, 2016)

High OSA Risk (STOPBang score of 5-8) (or yes to 2 or more STOP plus either Male gender, BMI >35, or neck circumference > 17 inches in male or >16 in female)
- Score of 6 or higher can establish a diagnosis (Fenton et al., 2015)
- Sleep Study Referral and use of CPAP (Epstein et al., 2009)
- Opioid prescribing should be carefully evaluated and followed, avoid when possible (CDC, 2016)
- Naloxone Prescription (CDC, 2016)
Methodology

• Testing Change:
  – PDSA Model
    • Utilized Throughout Implementation Phase
    • Testing Change
    • Evaluating Progress
    • Adjustments

Figure 1. PDSA (Duke University School of Medicine, 2016)
Results

• Data Analysis:
  – STOPBang Questionnaire Results
    • Reviewed & Categorized
      – Low, Intermediate or High-Risk
  – Sample Characteristics
  – Statistical Relevance
  – Application to Practice
Results

• Sample Characteristics:
  – Final Sample Size: 200
    • 81 Males
    • 119 Females
  – 64 High-Risk
  – 41 Intermediate-Risk
  – 95 Low-Risk
Results

• Sample Characteristics:
  – High-Risk
    • 33 Males & 31 Females
    • 52 Hypertension
    • 45 Over Age of 50
    • 3 Males Sent for Sleep Study Evaluation
High Risk Findings

High-Risk

Male  Female  Age over 50  Hypertensive

High Risk
Results

• Major Findings:
  – High-Risk
    • 21 Used CPAP Regularly
    • 18 Did Not Use CPAP Regularly
    • 8 Previously Identified as High Risk for Having OSA
      – Declined Sleep Study
      – $$$ Insurance Costs
  • 14 Other Participants
    – Negative Sleep Study
    – Lost Weight
    – UPPP Surgery
Results

- **Significance:**
  - 100% Previous OSA Diagnosis Screened High-Risk
  - 40% of Males Screened Were High-Risk
  - 26% of Females Screened Were at High-Risk
  - 81% Screened High Risk Treated for Hypertension
  - 70% Screened High-Risk Over Age of 50
  - 47% Screened Low-Risk for OSA
  - 20% Screened Intermediate-Risk for OSA
Nursing and Healthcare Significance

- Enhanced Need for Provider Awareness of OSA
- Need for Continuation of OSA Screening
- Heightened Patient Education
- Patient Follow-Up
Recommendations for Practice

• When Treating Chronic Pain with Opioid Medications:
  – Screen for OSA & Other Risks
    • Consider Sleep Study Evaluation
  – Medication Initiation & Titration
    • Consider Options/Alternative Therapies
  – Improve Patient Education
    • Risks and Outcomes
    • Responsibility in Maintaining Health
Future Plans

- Sustainability
- Incorporation into Provider Practice
- Need for Additional Evidence


References


